AMENDMENTS TO THE CLAIMS

Please **AMEND** claims 1, 19, 21, 24, 39, 43 and 46 as follows.

Please **CANCEL** claims 20, 25 – 35, 37, 38, 45, 55 and 56.

A copy of all pending claims and a status of the claims is provided below.

1. (Currently Amended) A method of measuring performance of a device, comprising:

thermally coupling a first heating device to a first sensing device;

generating heat at the first heating device;

measuring a change in at least one electrical characteristic of the first sensing device caused by the heat generated at the first heating device; ~~and~~

calculating a temperature of the first heating device using the measured change in the at least one electrical characteristic;

determining an offset between the first heating device and at least a second heating device, each having a different number of contacts; and

extrapolating the offset to zero contacts.

2. (Original) The method of claim 1, wherein the calculating step is further based on a temperature versus power level relationship for the first heating device using the measured change in the at least one electrical characteristics of the of the first sensing device at different power levels and different distances from the first heating device.

3. (Original) The method of claim 1, wherein the at least one electrical characteristic is a sub-threshold voltage slope.

4. (Original) The method of claim 1, wherein the measuring step includes measuring a series of measurements between the first sensing device and the first heating device at varying amounts of power applied to the first heating device.

5. (Original) The method of claim 1, wherein the measuring step includes measuring a series of measurements between the first sensing device and the first heating device at varying distances.

6. (Original) The method of claim 1, wherein the first heating device and the first sensing device are a field effect transistor.

7. (Original) The method of claim 1, wherein the at least one electrical characteristic comprises drain current versus gate bias voltage.

8. (Original) The method of claim 1, wherein the at least one electrical characteristic comprises sub-threshold voltage slope swing.

9. (Original) The method of claim 1, wherein thermally coupling the first heating device to the first sensing device is through silicon and comprises thermally coupling the first heating device to the first sensing device through a prescribed length of silicon.

10. (Original) The method of claim 5, wherein the thermally coupling is a distance between about 0.01 to about 5 μm.

11. (Original) The method of claim 1, further comprising calibrating the first sensing device by measuring a particular electrical characteristic of an active region of the first sending device held at a known ambient temperature.

12. (Original) The method of claim 11, wherein the first sensing device is held at a known temperature and a sub-threshold voltage slope is measured incrementally in a range from 0-0.4 volts driving voltage of the first sensing device.

13. (Original) The method of claim 12, wherein the sub-threshold voltage slope is measured incrementally at about 0.01V.

14. (Original) The method of claim 1, wherein generating heat at the first heating device comprises generating a substantially steady state heating, and measuring a change in at least one electrical characteristic of the first sensing device caused by the heat generated at the first heating device comprises measuring a substantially steady state change in the at least one electrical characteristic.

15. (Original) The method of claim 1, further comprising measuring a change in the at least one electrical characteristic of the first sensing transistor at room temperature.

16. (Original) The method of claim 1, wherein generating heat at the first heating device comprises running a current through the first heating device.

17. (Original) The method of claim 1, further comprising thermally coupling the first heating device to a second sensing device through silicon and measuring a change in at least one electrical characteristic of the second sensing device caused by the heat generated at the first heating device.

18. (Original) The method of claim 1, further comprising: thermally coupling a second heating transistor to a second sensing transistor through silicon; generating heat at the second heating transistor; and measuring a change in at least one electrical characteristic of the second sensing transistor caused by the heat generated at the second heating transistor.

19. (Currently Amended) A method of measuring performance of a device, comprising:

thermally coupling a first heating device to a first sensing device;

generating heat at the first heating device;

measuring a change in at least one electrical characteristic of the first sensing device caused by the heat generated at the first heating device; and

calculating a temperature of the first heating device using the measured change in the at least one electrical characteristic ~~The method of claim 1~~, wherein:

the generating step includes generating heat at the first heating device with a first number of contacts and a second number of contacts;

the measuring step includes:

measuring a change in at least one electrical characteristic of the first sensing device caused by the heat generated at the first heating device with the first number of contacts;

measuring a change in at least one electrical characteristic of the first sensing device caused by the heat generated at the first heating device with the second number of contacts; and

the calculating step includes:

calculating a temperature of the first heating device with the first number of contacts and the second number of contacts using the measured change in the at least one electrical characteristic; and

extrapolating results of the measurement obtained with the first number of contacts and the second number of contacts to zero contacts.

20. (Canceled)

21. (Currently Amended) A method of measuring performance of a device, comprising:

thermally coupling a first heating device to a first sensing device;

generating heat at the first heating device;

measuring a change in at least one electrical characteristic of the first sensing device caused by the heat generated at the first heating device; and

calculating a temperature of the first heating device using the measured change in the at least one electrical characteristic ~~The method of claim 1~~, wherein the measurement step includes establishing an amount of temperature change per contact between the first heating device and a second heating device having a different number of contacts and the calculating step includes

extrapolating results of the measurement step to zero contacts to determine an actual device temperature without an offsetting effect of the contacts.

22. (Original) The method of claim 19, wherein the second number of contacts is provided by subtracting at least one contact from the first number of contacts.

23. (Original) The method of claim 19, wherein the second number of contacts is provided by adding at least one contact to the first number of contacts.

24. (Currently Amended) The method of claim 1, wherein the measurement step includes providing a measurement differential taken with the first heating device and a the second heating device having a different number of contacts.

25. – 38. (Canceled)

39. (Currently Amended) An apparatus for measuring semiconductor device temperature, comprising:

at least one silicon island;

at least one heating field effect transistor configurable to generate heat arranged within the silicon island;

at least one sensing field effect transistor arranged within the at least one silicon island corresponding to each heating field effect transistor of the at least one heating field effect transistor, wherein each sensing field effect transistor is arranged a prescribed distance from its

corresponding heating field effect transistor and each sensing field effect transistor is configurable to sense a temperature; and

means to calculate a temperature of the each heating field effect transistor using a measured change in at least one electrical characteristic of the each sensing field effect transistor caused by the heat generated at the each heating field effect transistor, wherein the calculating means uses an offset between a first heating field effect transistor and at least a second heating field effect transistor of the at least one heating field effect transistor, each having a different number of contacts and extrapolates the offset to zero contacts.

40. (Original) The apparatus of claim 39, wherein the at least one silicon island is at least partially surrounded by an insulator.

41. (Original) The apparatus of claim 39, wherein the prescribed distance ranges from about 0.1 μm to about 5 μm.

42. (Original) The apparatus of claim 39, wherein the at least one silicon island includes a first silicon island including a single sensing and a single heating field effect transistor arranged a first prescribed distance apart, and a second silicon island including a single sensing and a single heating field effect transistor arranged a second prescribed distance apart.

43. (Currently Amended) The apparatus of claim 39, wherein the at least one heating field effect transistor is a first heating field effect transistor having a first number of contacts and a the

second field effect transistor having a second, different number of contacts, each configurable to generate heat arranged within the silicon island.

44. (Original) The apparatus of claim 43, wherein the calculating means calculates a temperature of the first heating field effect transistor and the second heating field effect transistor using the measured change in the at least one electrical characteristic and extrapolates results of the measurement to zero contacts.

45. (Canceled)

46. (Currently Amended) An apparatus for measuring semiconductor device temperature, comprising:

at least one silicon island;

at least one heating field effect transistor configurable to generate heat arranged within the silicon island;

at least one sensing field effect transistor arranged within the at least one silicon island corresponding to each heating field effect transistor of the at least one heating field effect transistor, wherein each sensing field effect transistor is arranged a prescribed distance from its corresponding heating field effect transistor and each sensing field effect transistor is configurable to sense a temperature; and

means to calculate a temperature of the each heating field effect transistor using a measured change in at least one electrical characteristic of the each sensing field effect transistor caused by the heat generated at the each heating field effect transistor,

wherein the at least one heating field effect transistor is a first heating field effect transistor having a first number of contacts and a second field effect transistor having a second, different number of contacts, each configurable to generate heat arranged within the silicon island, and

~~The method of claim 43,~~ wherein the at least one sensing field effect transistor senses a temperature of the first heating field effect transistor and a second heating field effect transistor and the calculating means extrapolates results of the sensed temperature differences to zero contacts to determine an actual device temperature without an offsetting effect of the contacts.

47. – 53. (Canceled)

54. (Previously Presented) The method of claim 1, further comprising:

arranging the first heating device and the first sensing device on an SiGe island; and

using a common source contact which leads to the source of both the first heating device and the first sensing device.

55. (Canceled)

56. (Canceled)

57. (Previously Presented) The apparatus of claim 39, further comprising:

a common source contact leading to the source of both the heating field effect transistor and the corresponding sensing field effect transistor.

58. (Canceled)

59. (Canceled)